Metropolitan Council
Working for the Region, Planning for the Future

Certified Mail P 385 843 539
Return Receipt Requested

ENVIRONMENTAL SERVICES DIVISION
Wastewater Services Department

September 3, 1997

Lynn Kuo, Environmental Engineer
United States Environmental Protection Agency
Air Enforcement and Compliance Assurance Branch (AE-17J)
77 West Jackson Boulevard
Chicago, Illinois 60604

Subject: Request for Information Pursuant to the Clean Air Act
Metropolitan Wastewater Treatement Plant

Dear Ms. Kuo:

Enclosed is the Metropolitan Council's Response to the referenced Request for Information (RFI).

Please be advised that when data was compiled to respond to the RFI, errors were discovered in the PM-10 amounts reported in the annual PM-10 report for two of the days cited in the Notice of Violation (NOV) and Finding of Violation (FOV) related to this RFI. Errors for July 21, 1993 and April 19, 1994 overstated the "Total Calculated PM-10 Emissions from the Emergency Stacks of Incinerators (lbs)". The nature of these errors is described below, after which corrected values are presented.

For July 21, 1993, a total of 718.1 pounds of PM-10 was charged to the Incinerator 7 Emergency Stack due to an estimated 323 minutes of damper opening time. All this time, however, occurred in the middle of a period of 12 hours of no sludge feed to the incinerator. The damper opening minutes should have been deleted after routine daily data review, but escaped detection and were improperly included in the PM-10 calculations.

For April 19, 1994, four separate damper openings, each exceeding 40 minutes, were all recorded twice and the excess minutes incorrectly used to calculate PM-10 emissions. Another lengthy damper opening, again over 40 minutes, was, however, not counted. Daily review of the operating data again failed in this case to detect these errors.

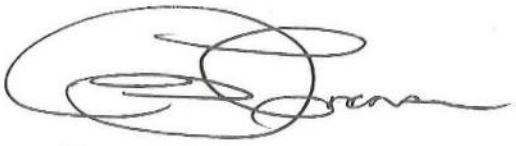
The impact of these data handling errors is shown in the corrected table below. Column headings are the same as used in the Finding of Violation and Notice of Violation. Values included in the FOV/NOV are shown in parenthesis.

Date	Total Calculated PM-10 Emissions from Emergency Stacks of Incinerators (lbs)	Total Calculated PM-10 Emissions from Incinerator Stacks (lbs)	Total Calculated PM-10 Emissions from Incinerators (lbs)
7/21/93	50.0 (768.1)	53.0 (53.0)	103.0 (821.1)
4/19/94	496.7 (785.8)	71.3 (71.3)	568.0 (857.1)

The impact of these corrections is to reduce the "Total Calculated PM-10 Emissions from Incinerators" below the thresholds cited in the NOV/FOV. As a result, both of these days should be deleted. Correct data for these dates is, however, still included with this RFI.

If you would like any further information regarding this matter please contact Rebecca J. Flood, Regulatory Compliance Manager, at 612-602-1073.

Sincerely,



William G. Moore
General Manager
Wastewater Services

cc: Steve Giddings, PCS Principal Supervisor P 385 843 540
Division of Air Quality
Minnesota Pollution Control Agency
520 Lafayette Road
St. Paul, MN 55155-4194
(with enclosure)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5

IN THE MATTER OF:

Metropolitan Wastewater Treatment Plant
2400 Childs Road
St. Paul, MN 55106

RESPONSE TO REQUEST FOR INFORMATION PURSUANT TO THE CLEAN AIR ACT

Metropolitan Council responds to the Request for Information dated July 30, 1997 as follows. The undersigned certifies that the information contained in the following responses is true, correct, accurate and complete to the best of the Council's knowledge and belief as of the date of the response. The Council reserves the right to amend or supplement its responses if it finds that inadvertent errors or omissions have been made or if additional or more accurate or complete information becomes available at a later date.

1. For each individual incinerator, numbers 5 through 10, for each of the twenty two days in the following table, MWTP must submit records of:

A. The hourly average scum feed rate to the incinerator;

RESPONSE: The hourly average scum feed rate to incinerators number 5 through 10 for the days indicated, as reflected in Council records, is set forth in attached Exhibit A. The exhibit contains one table for each of the 22 days specified.

B. The hourly average dry ton sewage sludge feed rate to the incinerator;

RESPONSE: The hourly average dry ton sewage sludge feed rate to incinerators number 5 through 10 for the days indicated, as reflected in Council records, is set forth in attached Exhibit A. The exhibit contains one table for each of the 22 days specified.

C. The specific time periods of incinerator operation;

RESPONSE: Time periods of incinerator operation for each of incinerators number 5 through 10 for each of the days specified, as reflected in Council records, are set forth in attached Exhibit B. The exhibit contains 22 tables covering the operational status of all six incinerators. Specific times are provided for each change in incinerator status, going from "ON" to "OFF" or the reverse.

D. The specific time periods in which the emergency damper was open.

RESPONSE: Time periods during which the emergency damper was open for each of incinerators numbers 5 through 10 for each of the days specified, as reflected in Council records, are set forth in attached Exhibit C. The exhibit contains 22 tables covering the status of the emergency damper for each of the six incinerators for each of the days specified. Specific times are provided for each change in damper position, going from "OPEN" to "CLOSED" or the reverse.

Please note two matters regarding the response to this question. First, the question asks for the times of all damper openings. There are frequent instances, some quite lengthy, when an emergency damper may be open for several hours, days or even weeks at a time while an incinerator is out of service. Before being taken out of service, any sludge that was still in the incinerator when feed is halted is burned-out through the air pollution control train before the ID fan is shut down and the emergency damper is opened. Thus there are no particulate emissions associated with such periods of damper opening. In response to the question, the exhibit includes such openings as well as those for which particulate emissions may occur.

Second, damper opening immediately causes incinerator sludge feed to stop. However, limitations in the computer time dating system may occasionally not show a direct correlation

Why?

What does this mean

between damper opening and incinerator sludge feed stopping even though they do, in fact, occur at the same time.

2. Describe the methodology by which each category set forth in the annual PM-10 reports submitted to the Minnesota Pollution Control Agency pursuant to Part V.B. of the MN SIP Administrative Order is calculated.

RESPONSE: The methodology by which each category (column) included in the SIP PM-10 report is calculated is described below.

OPERATING DATA

Damper Opening Minutes

This column contains an estimate of the daily total minutes that an emergency damper is open on the six available incinerators during times at which PM-10 emissions are assumed to be occurring.

The Metro Plant's computer system records the duration of each opening. This column includes an estimate of damper openings occurring after sludge feed stops but while some level of combustion continues through burning of the sludge already in the incinerator. This time is calculated in the following manner. Operating experience has shown that when sludge feed is stopped to an incinerator it takes a maximum of 45 minutes to completely incinerate the sludge still retained within the incinerator and stop the emission of gases. For the SIP report it is conservatively assumed that it will always take this full 45 minutes to completely incinerate the sludge retained within the incinerator. Therefore those emergency damper openings that occur within 45 minutes after sludge feed to an incinerator has been halted are included in this column. Openings that occur 45 minutes or more beyond the stoppage of sludge feed to an incinerator are not included for purposes of the estimate.

It must be noted that the estimate of time for damper openings after sludge feed is halted is conservative in assuming that sludge combustion always continues for a full 45 minutes after sludge feed stops. In most cases, combustion actually continues only for a period of approximately 25 to 30 minutes after sludge feed is stopped. The use of the conservative assumption results in overstating the time during which the emergency damper is open while PM-10 emissions are occurring.

Incinerator Dry Ton Per Day

This column is the daily sum of the dry tons of sludge incinerated in the six incinerators. Each daily incinerator dry ton total is calculated by the computer system by totaling the wet tons of sludge fed to each incinerator (determined via a weigh belt conveyor) and multiplied by the percent of solids in the sludge cake (determined by lab analysis of daily samples and entered into the computer data base).

Bag Filters Running Hours

This column is the daily sum of hours that the six available vacuum systems used in the conveyance of incinerator ash run each day. The run hours are monitored by the computer system via motor on/off status.

Boiler Fuel MBTU

This column sums the daily total BTUs, in millions, fed to the two auxiliary boilers available at the Metro Plant. Because the boilers can operate on either natural gas or fuel oil, the computer system monitors the feed rate of each fuel (via flowmeters) and calculates the total BTUs delivered accordingly.

LBS PM10 FROM OPERATIONS

Emissions from Damper Opening Lbs

This column contains an estimate of the quantity of the total PM-10 emissions from the four emergency stacks each day. Included in this are estimates of PM-10 emissions from: emergency damper openings, emergency damper leakage and any other miscellaneous occurrences where PM-10 may have been emitted through the emergency stack. The methodologies for estimating the PM-10 emissions for each of these categories are as follows:

* Emergency Damper Openings Emissions Estimate

Flue gas vented through the emergency stack does not pass through any air pollution control equipment and is called an uncontrolled emission. For purposes of the SIP report a PM-10 uncontrolled emission factor of 2.2 lbs/minute has been used, which was determined to be the worst-case emission rate. Field investigations and comparisons to EPA AP-42 emission factors indicate this to be a conservatively high value. The 2.2 lbs/minute rate is multiplied by the estimated time for damper opening occurring after sludge feed is halted as described in the Damper Opening Minutes discussion above.

The number calculated in this manner conservatively overstates the actual PM-10 emissions from emergency damper openings for the following reasons:

1. As indicated above, the 2.2 lbs/minute overstates the probable uncontrolled emission rate through the emergency damper compared to EPA's own AP-42 emission factor.

2. As discussed for the Damper Opening Minutes column, it takes some period of time after the stoppage of sludge feed, to completely carry out combustion of the sludge still retained within the incinerator. This process is called burning out the incinerator. Field observations have found that

during burn out the amount of PM-10 emitted in the incinerator flue gas progressively decreases to zero as the amount of sludge remaining in the incinerator decreases. However, for purposes of the SIP report it is conservatively assumed that the PM-10 emission rate throughout the 45 minute burn-out is constant and equal to the amount emitted at the start of the burn-out, i.e., 2.2 lb/minute.

3. Finally, in multiplying the 2.2 lbs/minute factor by estimated emergency damper openings after sludge feed stops, the actual sum of such minutes has already been conservatively over estimated as described in the Damper Opening Minutes discussion above.

* Emergency Damper Leakage Emissions Estimate

Under some incinerator and emergency stack conditions incinerator flue gas may leak past the emergency damper and vent through the emergency stack. Council staff has estimated the PM-10 emissions from this factor in the following manner.

Field studies have determined that under worst case leakage conditions typically 3-5 percent of the total flue gas exiting the incinerator will leak past the emergency damper. For the SIP report, it is conservatively assumed that 10 percent of the flue gas will leak through the emergency damper during leakage episodes. This 10 percent factor is applied to the uncontrolled PM-10 emission factor of 2.2 lb/minute, resulting in a 0.22 lb/minute factor for each minute of leakage. The daily minutes of leakage are determined through the methodology

described in the response to Item #6. For the SIP report, plant staff tabulate the total daily PM-10 emissions related to leakage and add it to this column.

Again, this method of estimation conservatively overstates PM-10 emissions for the following reasons:

1. As indicated above, the 2.2 lbs/minute factor overstates the probable uncontrolled emission rate from the incinerator as compared to the EPA's own AP-42 emission factors.

2. From September 1, 1995 (the date emergency damper leakage was first detected) through March of 1996, leakage was estimated at 10 percent of the flue gas flow. Sampling by the Council's Air Quality Section was conducted on March 18 and 19, 1996 to verify that value. Memoranda documenting the testing conducted and summarizing the results obtained are included with the material provided in response to Item #7. The March 18 and 19 testing verified that measured leakage was well below the 10 percent value being used. The Council at that point elected to continue using the 10 percent figure so as to include a high degree of conservativeness in reporting PM-10 emissions from emergency damper leakage. This action is conservative in that it serves to ensure that reported emissions exceed the actual amounts.

* Miscellaneous PM-10 Emissions Estimate

Infrequently emissions of PM-10 through the emergency stack occur that aren't accounted for in the emergency damper opening or leakage categories. Such an event might be when a quantity of incinerator ash is inadvertently

discharged through the emergency stack when a cold incinerator is being cleaned out (ash beds removed from hearths) for annual maintenance. When such an incident occurs, the amount of PM-10 emitted is conservatively estimated and included in the column's daily tabulation.

INC. Lbs

This column sums the daily PM-10 emissions from each incinerator emitted through the normal off gas, or controlled, route. The daily PM-10 emission for each incinerator is calculated by the computer system using the PM-10 emission rate (in lbs/dry tons of sludge) determined during the most recent annual performance stack test, multiplied by the total dry tons incinerated in that incinerator. The dry tons are determined as described in the Incinerator Dry Ton Per Day column.

Bag Filtr Lbs

This column sums the daily PM-10 emissions from the six vacuum systems that are available for the conveyance of incinerator ash from various locations within the incinerator building to the ash load-out facilities. The plant computer system calculates the daily emission from each vacuum system by multiplying the vacuum pumps ON hours (see Bag Filters Running Hours column discussion) by the PM-10 emission factor (in lbs/hr). The PM-10 emission factor was determined by stack performance testing on each vacuum system stack. Because of stack size limitations, approved PM-10 sampling procedures could not be employed; therefore, each stack was sampled for total particulate and the results were conservatively used as the PM-10 emission factor, assuming that 100 percent of the particulate matter was PM-10.

Boiler Lbs

This column sums the PM-10 emissions from the two auxiliary boilers present at the plant. The plant computer system calculates the daily emissions from each boiler by multiplying the BTU input (see Boiler Fuel MBTU column discussion) to the boiler by the PM-10 emission factor (in lb/million BTU). The PM-10 emission factor was determined by stack performance testing on each boiler stack.

Actual Total PM-10 Emissions Lbs

This column is the sum of Emissions from Damper Opening Lbs, INC Lbs, Bag Filtr Lbs, and Boiler Lbs columns. It overestimates actual total PM-10 emissions because of the conservative assumptions for Emissions from Damper Opening Lbs and Bag Filter Lbs as described above.

Total Actual PM-10 Less Allowable PM-10 Quantity Lbs

This column is the difference between the Actual Total PM-10 Emissions column minus the amount of 1,279 lbs/day. 1,279 lbs/day represents the total of emission limitations for the controlled sources of PM-10 emission, i.e., from the controlled stacks of the six incinerators, the six bag filters, and the two auxiliary boilers. Would envelope be broken w/ leakage and damper

Provide results from the stack tests since 1992 that were performed to arrive at these values.

RESPONSE: Results of stack tests since 1992 used to arrive at the referenced values are set forth in attached Exhibit D.

3. For each individual incinerator, numbers 5 through 10, MWTP must submit records from 1993 to 1997 of the date and time duration in which

A. The emergency damper was open for more than an hour;

RESPONSE: For the purposes of responding to this request, the Council assumes that the inquiry relates to dates and times during which an emergency damper was open while combustion of sludge may have been taking place and PM-10 emissions may have been occurring. The following factors are responsible for the extremely limited frequency of this condition:

* Whenever the emergency damper opens in response to a "dump" condition, the sludge remaining in the incinerator burns-out through the emergency damper in a maximum of 45 minutes. PM-10 emissions rapidly taper off when the damper opens and completely cease before 45 minutes pass. (See the additional discussion of this matter in the response to Item #2.)

* There are frequent instances, some quite lengthy, when an emergency damper can be open for several hours, days or even weeks at a time. In these instances, the incinerator is out of service. Sludge still in the furnace when feed is intentionally halted is burned-out through the air pollution control train before the ID fan is shut down and the emergency damper is opened. Thus there are no PM-10 emissions associated with these periods of damper opening.

Information regarding time periods for damper "OPEN" or "CLOSED" position are being provided in response to the request in Item #1D.

During the years 1993 to 1997 the Council has identified one instance in which it appears that the emergency damper was open for more than one hour while combustion of sludge may have been taking place and PM-10 emissions may have been occurring. This instance occurred in October of 1995, and was associated with the Electric Gate Lifts for the emergency dampers on Incinerators 7 and 8. The Electric Gate Lift is a back-up actuator for the emergency damper

for use if the normal hydraulic operator for the damper fails. The Gate Lift opens the damper 15 to 20 percent to insure continued draft. As such it is an essential back-up safety system.

On Friday, October 6, 1995, the gate lifts for Incinerators 7 and 8 were exercised at a time when these incinerators were not in service. Later that day, feed began to both incinerators although the Gate Lifts were still engaged and the emergency dampers were still partially open. A flaw in the Gate Lift control software allowed feed to continue with the dampers open. During this time period, the ID fans were running for both incinerators and most of the flue gas was thereby pulled through the air pollution control train in spite of the open dampers. The situation was discovered on Monday, October 9, at which time the dampers were immediately closed. The Gate Lift controls were subsequently corrected. Adjustments were made to the October 1995 SIP report to account for the additional amounts of PM-10 emitted

B. The control equipment was down for more than an hour.

RESPONSE: For the purposes of responding to this request, the Council assumes that the inquiry relates to dates and times during which the control equipment was inoperative or non-functional while combustion of sludge may have been taking place and PM-10 emissions may have been occurring. Using that standard, there are no instances during the time period in question during which the control equipment was "down" in this sense for more than an hour.

The Council has identified two situations where parts of the control system may occasionally function at less than full efficiency for more than an hour and increased particulate emissions may occur. The Council does not consider these situations to be "down" time but these situations are described below for the agency's information.

1. The first relates to the mist eliminators and came to the Council's attention after the failed stack tests in 1995 and 1996 and occasional physical observation of water droplets being emitted from the stacks. A detailed description of this condition follows.

Since the mist eliminator diameter is either eight or ten feet, but the access hatch into the subcooler is only 30 inches, the mist eliminator is constructed of numerous different pieces. The pieces are fitted together on a support grid in the subcooler and locked in-place by metal hold-down bars on top. This locking is an important element since the mist eliminator is exposed to a vacuum of almost 70 inches of water created by the induced draft fan. Council staff has concluded that this high vacuum may on occasion dislodge a piece sufficiently to open up a gap between 2 adjacent pieces or around the perimeter. This allows condensed water in the subcooler to pass through the gap. In such a case, the gap could close if the ID fan were shut off, thereby breaking the vacuum, or if fan operation caused a reduction in vacuum. When the ID fan is subsequently restarted there is no certainty that the gap will reopen.

The possibility that mist eliminator moisture loss might cause increased emissions was not clearly understood until after the June 18, 1996 stack test on Incinerator 7. Even though maintenance had been performed anytime it was known that a mist eliminator had been dislodged at all, there was no reason to consider it a potential source of additional emissions. Once this possibility was recognized, monitoring of mist eliminator status through on-going examination of subcooler and stack temperatures was initiated in July of 1996.

In most cases it is not possible to positively conclude that an increase in emissions results from the described condition. Since the mist eliminators cannot physically be viewed during operation, they are monitored through visual observations of discharge stack conditions, such as an obviously "wet stack" emitting moisture droplets, or through recording of unusual stack

temperatures. These conditions demonstrate that some excess moisture is passing through the mist eliminator, but do not necessarily mean that particulate emissions have increased. Without stack testing during such a situation, the impact upon particulate emission levels cannot be directly known.

In the case of the failed stack tests in 1995 and 1996, the tests showed that an increase in total particulate emissions occurred which is now assumed to have been caused by the mist eliminator problem. These two events occurred during total particulate stack testing in which a direct measurement of particulates was obtained which is not normally available. Even in these two cases, however, no increase in the emission of PM-10 can be positively identified. The size of particles washed off internal surfaces, such as the straightening vanes or the Oxcel silencer, by excess water would certainly be larger than PM-10. Particles carried up through the mist eliminator may or may not be PM-10. Since these tests measured only total particulates, it is impossible to know whether PM-10 emissions increased.

In addition, even when direct testing revealed an increase in total particulate emissions, such as in the Incinerator 7 stack test on June 18, 1996, it is not possible to determine whether emissions remained elevated after the test was completed. The time period following the Incinerator 7 stack test (6/18 through 7/9/96) illustrates the complications in evaluating the status in such cases. Although increased total particulate emissions appeared to occur on June 18 as shown by the stack testing, the incinerator went through several "ON/OFF" periods of ID fan operation after the test before the mist eliminator was ultimately removed for a newly cleaned unit on July 9, 1996. The impact on particulate emissions during these operational times is unknown.

In order to eliminate the uncertainties involved in the possibility of increased emissions in the event of a mist eliminator situation as described above, a new style of mist eliminator is being tested. This consists of 3 separate layers of one-piece mist eliminator material. The separate layers are unrolled inside the subcooler once they are through the access hatch. The possibility of gaps opening between adjacent pieces is thereby theoretically eliminated.

2. The second situation relates to the venturi dampers. A detailed description of this condition follows.

The Council has identified three scenarios where the venturi damper may operate in an unintended manner. Only one of these scenarios may create the possibility of increased emissions. Each is described below:

* Situations where the damper sticks in a relatively closed position. This results in the creation of too much differential pressure, which might theoretically improve emissions, but at worst does not increase them.

* Situations that result in the creation of less differential pressure than the control setpoint value, but still more than the minimum non-reportable value based on the last total particulate stack test. This scenario also presents no basis upon which excessive emissions would result.

* Situations that result in the creation of less differential pressure than the minimum non-reportable value based on the last stack test. This situation creates venturi differential pressure excursions reportable under the plant's Air Permit.

One of these situations exceeding one hour occurred on Incinerator 7 in March 1997 when a mechanical problem prevented the damper blades from closing. During this time period

a differential pressure of 14 to 19 inches of water was still created, compared to the minimum non-reportable value of 20.4 inches applicable at the time.

The other situation exceeding one hour occurred on September 11, 1996 when the damper controller for Incinerator 10 was accidentally left in MANUAL control and failed to meet the set-point differential pressure. The resultant differential pressure of 15 to 16 inches was somewhat lower than the minimum non-reportable value of 21.1 inches.

Even with the situations described above, for which the quantity of differential pressure created did not meet the minimum non-reportable value, it is not possible to positively conclude that emissions increased. Information from EPA, as well as the Council's own work, has indicated that it is very difficult to determine a relationship between particulate emissions and operating parameters of the particulate emission control systems. EPA conducted its first review of the New Source Performance Standards (NSPS) for sewage sludge incinerators in 1979. (Helfand. A Review of Standards for Performance for New Stationary Sources - Sewage Sludge Incinerators. Mertek Division of MITRE Corporation for USEPA. 1979) The results of tests conducted of 26 different sewage sludge incinerators demonstrated that "There does not appear to be a consistent relationship between pressure drop in the scrubbers and emission values."

For the second review of the NSPS, a total of sixty incinerators were used for evaluation. Acurex Corporation, EPA's contractor for the study, concluded that "no discernible relationship could be found between emissions and either scrubber pressure drop, sludge moisture or sludge loading rate." Experience at the Metro Plant supports these conclusions. As a result, the operation of a venturi scrubber at a differential pressure of 3 or 4 inches less than the minimum non-reportable value cannot be automatically assumed to have increased emissions.

4. MWTP must submit records of the daily hours of operation for each individual incinerator between the years of 1993 and 1997.

RESPONSE: Records of daily hours of operation for each individual incinerator between the years of 1993 and 1997 are set forth in attached Exhibit E. This material consists of a daily summary of each month showing the hours of operation for each incinerator for each day.

5. Regarding the processes related to N-viro Soil and Nutralime, MWTP must submit the following:

A. Detailed descriptions of the on-site operation processes for each material, including description of material storage;

RESPONSE: N-Viro Soil. The N-Viro Soil process involves the blending of dewatered sewage sludge, lime kiln dust, and coal ash at the Seneca Wastewater Treatment Plant in Eagan, Minnesota. The blended material (with total solids content of approximately 50 percent) is trucked to the Metropolitan Wastewater Treatment Plant in "walking-floor" semi-trailers. Generally, a maximum of eight trailers per day, four days per week, are delivered which constitutes approximately 700 wet tons per week. The material remains in the trailers for less than 24 hours. The material is then unloaded directly into an open-sided pole barn-type building. The material is turned at least three times during a four day period in this building using a Scarab compost turner. Finally, the material is transported, using a five cubic yard loader, to a storage pad which is about 200 feet away. The storage pad is approximately three acres in size. It is paved with asphalt and is curbed. Material is stacked with the loader. If additional storage capacity is needed, a conveyor-belt stacker is used to make the stockpiles taller.

NutraLime. NutraLime is a blend of sewage sludge incinerator ash and spent water treatment lime sludge. The ash is generated at the Seneca Wastewater Treatment Plant and is

delivered periodically to the Metropolitan Wastewater Treatment Plant in dump trucks. The lime sludge is generated by the cities of Minneapolis and St. Paul. It is also delivered to the Metropolitan Wastewater Treatment Plant periodically in semi-trailers. Both materials are delivered to the NutraLime pad. At the NutraLime pad, the two materials are placed on top of each other in a long (50 to 100 foot) windrow which is about four feet high. This operation is performed using a five cubic yard loader. The windrow is then blended using a Brown Bear auger/turner. After blending, the material is stored on the NutraLime pad. The NutraLime pad is asphalt-paved and is curbed on the downslope side.

B. The duration each operation has existed at MWTP;

RESPONSE: N-Viro Soil. The N-Viro Soil process has been operating since August, 1992. Prior to this time several small demonstration-scale operations were conducted.

NutraLime. The NutraLime process has been operating since August 1990.

C. Annual quantities of each material that have been produced since the start of operations;

RESPONSE: The following quantities of N-Viro Soil have been produced since the start of operations:

1992 13,560 wet tons

1993 58,390 wet tons

1994 38,262 wet tons

1995 38,630 wet tons

1996 38,809 wet tons

The following quantities of NutraLime have been produced since the start of operations:

1990 23,374 wet tons

1991 40,694 wet tons

1992 87,693 wet tons

1993 96,383 wet tons

1994 12,673 wet tons

1995 3,602 wet tons

1996 4,204 wet tons

D. Average on-site quantity of each material at any given time;

RESPONSE: The following is an estimate of average quantity of materials on-site at the Metropolitan Wastewater Treatment Plant at any given time:

N-Viro Soil:	Lime kiln dust:	0
	Coal ash:	0
	Blended product:	10,000 wet tons
NutraLime:	Sewage sludge ash:	200 wet tons
	Water treatment lime sludge:	200 wet tons
	Blended product:	1000 wet tons

E. Descriptions of any methods currently used to reduce fugitive emissions from the operations.

RESPONSE: All materials stored are moist having total solids contents in the 40 percent to 70 percent range so fugitive emissions are minimal. When storage pads become dusty, due to vehicle traffic over a thin layer of dried material, they are wetted down and the material washed into process drains returning to the treatment facility.

6. MWTP must confirm in written form, if true, that monitoring of emergency stack leakage from the incinerators using pressure and temperature gauges has occurred

twenty-four hours a day on all emergency stacks since September of 1995. If not true, MWTP must describe in detail the monitoring of emergency stack leakage up to the present time.

RESPONSE: The first documented case of emergency stack leakage occurred in September of 1995. On Friday, September 1, the common emergency stack serving Incinerators 5 and 7 was visually observed to be smoking lightly even though both units were in service with their induced draft fans operating.

The Council's Air Quality Section was contacted to try to measure air flow in the emergency stack. Their efforts at measuring flow on September 5, 1995 (see document provided in response to Item #7) were inconclusive due to the small amount of air flow in the stack. Air Quality then attempted to make a qualitative judgment of the degree of leakage. Visible emissions were read for six minutes at 15-second intervals. All opacity readings were zero.

Air Quality returned to the plant on September 12, 1995 to recheck the common emergency stack serving Incinerators 5 and 7, but again could draw no firm conclusion (see memorandum provided in response to Item #7). Visual inspections conducted over the next several days did not detect any further leakage.

On-going visual inspections of the emergency stack showed no leakage until October 10, 1995, at which time emissions from the common emergency stack serving Incinerators 5 and 7 were again detected. The visual observation that leakage was occurring was verified by Air Quality work on October 12, 1995. They extracted gas samples from the emergency stack and measured CO, CO2 and NOX. Results definitely confirmed the presence of flue gas (see memorandum provided in response to Item #7).

After this second episode, it was clear that a better method of detecting leakage than visual observations was needed. On October 17, 1995, a Work Order was written for the Metro Maintenance Shop to install thermocouples with temperature transmitters connected to the plant computer system in each emergency stack. At the same time, work was started to ready equipment to monitor the differential pressure across the emergency dampers. The draft on Hearth 0 was already being monitored by the computer for each incinerator.

By combining the information provided by the Hearth 0 draft sensor, emergency damper differential pressure transmitter and emergency stack thermocouple, leakage periods can be definitively identified. Video trends were created on the plant's Process Control Computer System to display this information and the data was captured in the plant's historical data base.

Monitoring of the computer trends started when the first stack thermocouple became active on October 23, 1995. As additional thermocouples and differential pressure transmitters became active, daily monitoring on a continuous basis was expanded until the final components of the system, thermocouples for the emergency stacks for Incinerators 9 and 10, went into service on January 23, 1996. Continuous monitoring of emergency stack leakage from all the incinerators, using pressure and temperature gauges, subsequently started on January 24, 1996. Monitoring has been conducted each day since that date up to the current time and will continue on a daily basis as needed.

The actual monitoring is conducted by technical staff working in the Incineration portion of the plant. Paper copies of the operational parameters for each emergency stack over the past 24 hours are printed from the computer trends. Periods of leakage are identified from analyses of the temperature and pressure data displayed. The leakage times are noted on the trends for subsequent processing for recordkeeping and reporting purposes. On a monthly basis the leakage

periods are tabulated and delivered to the Plant Records group for use on the annual PM-10 SIP report. The process used to convert the duration of leakage into PM-10 emissions is described in the response to Item #2.

One change in monitoring method was made after continuous monitoring had begun. The differential pressure transmitters for the emergency dampers were converted to read static pressure on the emergency stack side of the dampers. This change was made to simplify interpretation of the pressure readings on each side (emergency stack and Hearth 0) of the damper. There were no lapses in continuous leakage monitoring during the switchover, which occurred in the second half of March 1996. Estimated PM-10 emissions from emergency damper leakage has been reported on the SIP reports for all leakage identified starting with the initial incident on September 1, 1995.

7. MWTP must submit all reports, documents, and other information regarding all investigations performed by, or on behalf of, MWTP of the emissions from all four emergency bypass stacks, including, but not limited to, any mass balance analysis performed on the stacks.

RESPONSE: Documents responsive to this request are attached as Exhibit F.

8. MWTP must submit:

A. Information acquired from investigations or research into methods to repair, replace, upgrade, maintain equipment to achieve compliance with the PM-10 emission standards, and associated reports;

B. Any cost estimates of the methods found in part A above.

RESPONSE: The Council currently is in compliance with PM-10 emission limits which are measured by controlled emissions from incinerator, boiler, and bag filter stacks. The Council

has also undertaken several investigations and research into methods to reduce emissions from incinerator emergency stacks which are not controlled emissions and are not subject to PM-10 emission limits. Documents describing these efforts and any cost estimates are attached as Exhibit G.

9. MWTP must submit the Title V permit application.

RESPONSE: The Title V permit application for the Metropolitan Wastewater Treatment Plant is attached as Exhibit H.

10. MWTP must submit the following information:

A. When each incinerator, numbers 5 through 10, was constructed;

RESPONSE: The dates of installation, start of operation, and modification of Incinerators 5 through 10 are listed on Form GI-09D in the Title V permit application attached as Exhibit H. The year in which construction was started on each of the incinerators is as follows:

Incinerator 5: 1968

Incinerator 6: 1968

Incinerator 7: 1968

Incinerator 8: 1972

Incinerator 9: 1980

Incinerator 10: 1980

B. The date and nature of any subsequent physical changes made to each of the individual incinerators, numbers 5 through 10;

RESPONSE: Changes to Incinerators 5 through 10 are identified in the addendum to Form GI-09C in the Title V permit application attached as Exhibit H. In addition, in 1989 the Hearth 0 burners in each incinerator were modified to comply with anticipated

pollution control requirements. In 1997, the auxiliary fuel burner configuration in Incinerator 8 was altered as part of a project to evaluate centrifuge dewatering technologies. The following is a description of these modifications.

1989 Afterburner Modification

The MPCA issued air emission permit No. 879-90-OT-3 on July 12, 1990. This permit introduced a new requirement to maintain a minimum Hearth 0 temperature of 1200°F. In anticipation of this permit condition, during 1989 the number of Hearth 0 burners was increased from two to four by physically relocating two burners from Hearth 6 to Hearth 0. The Hearth 6 burners were not replaced. The firing capacity of each of the resultant four Hearth 0 burners on each of Incinerators 5 through 10 was increased from 2.7 million British Thermal Units per hour (MMBtu/hr) to 3.2 MMBtu/hr. Hearth 0 functions as an afterburner to ensure complete destruction of the volatile organic compounds that are driven off or formed in the sludge combustion process on the lower hearths. Therefore, the increase in Hearth 0 burner capacities qualifies as installation of pollution control equipment.

The change in burner capacities was not reflected in Permit No. 879-90-OT 3 when it was reissued in 1990. The change in emissions associated with the auxiliary fuel combustion system, expressed as the difference between unrestricted potential emissions and past actual emissions, exceeds the PSD/NSR de minimis thresholds for oxides of nitrogen (NO_x) and sulfur dioxide (SO_2). However, actual emissions have never exceeded the de minimis levels. On May 19, 1997, MCES submitted a major permit amendment application requesting voluntary limits on auxiliary fuel consumption to

is "major" stationary source restriction to pollutant

provide enforceable assurances that the actual NO_x and SO_2 emissions increases would never exceed the corresponding de minimis threshold.

Three figures are attached as Exhibit I. A comparison of the proposed fuel firing limits with historical fuel consumption is illustrated in Figure 1. Figure 2 shows the corresponding relationship between limited and actual NO_x emissions and Figure 3 shows the corresponding relationship between limited and actual SO_2 emissions.

1997 Incinerator 8 Auxiliary Fuel System

In 1997, the four existing Hearth 0 burners on Incinerator 8 were decommissioned. Two new burners were installed in each of Hearths 2, 4, and 6. However, the two new burners on Hearth 4 were subsequently decommissioned. There was no increase in total burner capacity, and therefore no change in potential emissions. Actual fuel usage and actual emissions did not change as a result of the insignificant modifications.

C. The date and nature of any subsequent changes made to the method of operation;

RESPONSE: No operational changes associated with the Incinerators 5 through 10 were made other than those associated with physical modifications, which are described elsewhere in this response.

D. Any calculation of an increase in emissions as a result of such a physical or operational change.

RESPONSE: Emission calculations for the 1989 increase in burner capacities are provided in the MPCA permit application forms, copies of which are attached as Exhibit J. No other modifications resulted in an emission increase.

METROPOLITAN COUNCIL

Date: 9/3/97

By: _____
William G. Moore
General Manager, Wastewater Services